Suggestions for designing a tennis-specific strength and conditioning program

Suggestions for Designing a Tennis-Specific Strength and Conditioning Program

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INTRODUCTION

In tennis, the optimal execution of any given stroke requires different adaptations of learned motor patterns in coordination with the requirements of strength, power, speed, agility and balance.

Strength and conditioning training not only prepares the athletes for such demands, but also enables complete integration with the tactical/technical and psychological elements of the sport. Meaningful integration of conditioning training with the required game skills assists the athletes' understanding of these requirements of the sport. Further, results of such integrated programs are athletes that enjoy their physical training as much as playing tennis.

This article aims to give coaches who may also be responsible for their athlete(s) conditioning sessions some suggestions in designing programs that are specific to the sport as well as giving athletes meaningful exercises at training.

Prescription of conditioning training vs. specifics (or realities) of tennis.

Coaches will be familiar with the theoretical concepts of specificity; that is the maximum benefits of a training stimulus can only be obtained when it replicates the movements and energy systems involved in the activities of a sport (Rushall and Pyke, 1990), therefore the greater the similarity of a training activity, the more likely transfer of adaptation to performance (Fleck and Kraemer, 1987).

As McClellan and Bugg (1999) correctly point out, many conditioning exercises prescribed by coaches of tennis athletes as 'specific' to tennis are in reality exercises for general fitness development. These exercises include (amongst others) leg presses, squats, leg extensions, leg curls, bench press, dumbbell flyes, and reverse flyes.

So although these exercises can benefit the tennis athlete, why are they not tennis-specific exercises? Table 1 summarises the fundamental differences between these exercises and the realities of the sport, with Figures 1 and 2 illustrating differences between traditional and specific exercises.

Suggestions for programming conditioning training.

Coaches can work on athletes' conditioning not only in the gym environment, but also at the courts. In many cases coaches may not have opportunities to get to a gym, therefore athletes' have no alternative but to improvise specific exercises at the courts. Similar to the gymnasium environment, there are specific exercises that will transfer to the sport more effectively than generic exercises. Coaches should aim to prescribe exercises that are specific to serving, return of serve and movement during rallies. Table 2 shows some simple but effective alternatives to traditional exercises.

Athletes' who have access to

gymnasiums should also follow the principle of specificity. Table 3 shows some specific exercises which particularly focus on unilateral and lunge movements. Although benches and machine weights have a role in general conditioning training, for a sport such as tennis, which relies heavily on proprioception and stability during movement, exercises should be free and dynamic to develop and enhance balance concurrently with strength and speed.

It should also be noted that although we suggest that exercises should be unilateral, symmetrical muscular balance between dominant and non-dominant sides is paramount, particularly with the upper extremity strength which favours the dominant side over the non-dominant side (see review by Roetert and Ellenbecker, 2002). Although athletes may find doing exercises on the non-dominant side unfamiliar, they still should nevertheless be completed for the prevention of injury.

Other alternatives - medicine ball training and plyometrics

Medicine ball training is also an effective tool for conditioning. On or off court, it is an enjoyable alternative to traditional conditioning exercises and for the junior athlete it helps develop new motor patterns. Further, medicine ball exercises can accommodate several requirements of training (for example, speed and balance) concurrently. The key to medicine ball exercises is to change the exercise routine very frequently. This will prevent fatigue of the neuro-muscular pathways: important for maintaining an athlete's coordination.

Plyometric exercises are also an effective alternative to only weight room exercises. Plyometric training bridges the gap between strength and power, and is known to directly enhance competitive performance (Chu, 1998). However for best results research studies have shown that a combination of strength conditioning and plyometric training gives superior performances gains than just strength training or plyometric training alone (Adams et al, 1992; Wilson, 1994).

Similar to medicine ball activities, it is very important that the athlete is exposed to a variety of different drills. The basic plyometric activity should include elements of balance, agility, body coordination, hand-eye coordination, spatial and body segmental awareness. This will keep the athlete interested, injuries to a minimum (avoid overuse of the same exercise routine), and will help the athlete accrue a greater number of motor patterns that can be used in their sport.

Recommendations to coaches

Coaches should not be limited to traditions either out on court or in the gym. Being mindful of any contraindications that could harm athletes, coaches should aim to scrutinise and analyse specific movements and not be afraid to experiment with exercises that can model the specifics of the sport. Further, when implementing new exercises and/or a new conditioning program, talk and obtain feedback on the effectiveness of the program with the athlete(s).

Specifically for younger athletes it is important to expose them to as many motor skill variations as possible. The more they accrue early in their sporting career, the better off they will be once they are more senior. Furthermore, if athletes have the possibility of becoming professional athletes often they are so busy with competitions and travel that they are unable to do much ground/core conditioning resulting in an increased occurrence of injury. If athletes are conditioned the appropriate way early in their careers they are then able to hold a high conditioning level much easier than having to try to develop one when participating in the demanding arena of professional/elite sport.

Finally, focussing on varied but specific conditioning routines ensures that athletes, particularly young athletes, are getting a varied training routine which will ensure minimising overuse injuries (from repeated activities from limited general exercises). Moreover, programming meaningful exercises will increase enjoyment, minimising the chance of dropout of junior athletes due to boredom and rigidity of training, a big factor in the high participation dropout rates in junior sport.

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Table 1. Summary of conditioning exercises prescribed compared to the realities.

Traditional conditioning	Realities of the sport
• Exercises are bilateral (both limbs move together during exercise). • Prescribes leg exercises in squat nature.	• Movements are unilateral (one side provides force production). • Leg movements are usually of a lunging nature (or at least in a split position).
• Apart from selected abdominal exercises, exercises are performed in one plane.	• Skills revolve around rotational movements in a multi-plane environment.
• Focus is on maximal strength as an assumption of force development.	• Sports are time related, thus power is more important.
• Conditioning is primarily involved with initial movement.	• Rallies are generally lost due to ineffective recovery once execution of a shot is completed.
• Little proprioception work.	• Strokes and movements require good transfer of balance and body self-awareness.

Table 2. Conditioning at the courts – typical examples of traditional exercises and some alternatives.

Traditional	Possible alternative(s)
• Double leg jumps	• Scissor jumps
• Forward lunges	• Oblique and cross over lunges
• Single leg hops	• Alternative angle leg bounding (forward and reverse)

Table 3. Conditioning in the gym.

Traditional	Possible alternative
• Squats	• Split squat
• Bench press	• Single arm dumbbell press (using Swissball)
• Abdominal crunches	• Twisting walk lunges (forward and reverse)

Table 4. Plyometric exercises as alternatives for traditional gym exercises.

Traditional	Possible plyometric alternative(s)
• Single leg calf raisers	• Single leg oblique jumping
• Squat	• Scissor jumps; squat jumps (with variations)
• Dumbbell flyes	• Medicine ball throw

Figure 1. Traditional weight room exercise – Incline Leg Press. Notice bilateral movements of lower limbs and the removal of balance and proprioception required during the performance of the exercise.

Figure 2. Example court specific exercise – Oblique Lunge. This exercise is a good example of replicating the specifics of movements and position during the execution of a volley.

How to Develop Independence in Tennis Players

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INTRODUCTION

The development of independence in tennis players is one of the foremost objectives in tennis training. As is the case with all open skill sports, the ability to evaluate situations and make positive decisions is a constant for successful player development.

A player's independence is closely associated to his level of self-confidence, and its development should commence upon the player's first introduction to the game. Self-confidence is the belief that you can successfully perform a desired behaviour.

As coaches, it is our job to help players develop their confidence and accomplish their goals (i.e. victory). Realistically evaluating players' strengths and weaknesses, and then demonstrating our faith in their ability to succeed, will help here. To invest such faith in a player is quite "persuasive" in facilitating that player's belief in his own abilities.

On the contrary, if as coaches we are not confident in ourselves, it is difficult to transfer confidence to our players. An interesting aside to any successful transfer though, is that players are provided with a direct example of confidence at work such that they can begin the process of increasing their own self-confidence. A process that is largely defined by the